Views on Arctic Observations

Jim Maslanik
Professor, Aerospace Engineering Science
University of Colorado

- **The need exists to take more advantage of automated observing networks (surface-based and UAVs) to augment satellites.** I am increasingly starting to think that we've gone too far in our desire to rely so heavily on satellite sensing for some applications. The value of satellite data could be improved (greatly so, in some instances) if the data could be merged with some higher-accuracy in-situ measurements.

- **Autonomous vehicles, including low-cost UAVs such as the Aerosondes that are currently being tested in Barrow and used elsewhere, should form part of a network of sensors** (along with moorings, deployed surface instruments, atmospheric profilers, spaceborne imagers and sounders, etc.) that address the earth as a multidimensional system to provide data through the ocean-ice-atmosphere column over large spatial areas and with routine, frequent sampling. In order to be cost effective, research is necessary to identify key locations (or "centers of action") for deployments, with UAV and satellite data used to interpolate between deployment points. International access and cooperation must improve, to make such a global network feasible.

- **Satellite remote sensing algorithms need to move beyond the traditional "single-sensor" approach to make better use of multi-sensor methods**, such as combining thermal and passive microwave data, scatterometer and passive microwave, etc. As the accuracy requirements for products increase, single-sensor algorithms tend to run up against fundamental limitations that reduce their value for applications such as model evaluation and data assimilation.

- **Product generation from remote sensing will continue to progress toward merging of algorithms with physical models, via data assimilation or other methods**. This synthesis of modeling and remote sensing will provide a valuable route for taking advantage of separate advances in modeling and remote sensing, and will provide better guidance for data collection targeted at specific types of uncertainties and errors.

http://www-ccar.colorado.edu/ip/htdocs/personnel/professors/maslanik/maslanik_root.html